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Macroeconomic Conditions of Economic and Organisational Changes in Polish Dairy Farms in the Period 1989–2009

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dozwolonego użytku.

**MACROECONOMIC CONDITIONS OF ECONOMIC
AND ORGANISATIONAL CHANGES IN POLISH DAIRY
FARMS IN THE PERIOD 1989–2009¹**

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Key words: milk production, dairy farms, dairies, economic factors.

Abstract

In the period 1989–2009, the Polish economy and milk sector experienced profound changes. After the collapse of milk production and milk collection in the period 1990–1995, milk production and milk processing began to recover. The price competitiveness of milk in comparison to other agricultural products began to improve (2005 was the most favourable period in this respect). The greatest influence on the process of changes in dairy farms was exerted by dairies, mainly through milk price calculation methods.

**MAKROEKONOMICZNE UWARUNKOWANIA ZMIAN
EKONOMICZNO-ORGANIZACYJNYCH W POLSKICH GOSPODARSTWACH
MLECZNYCH W LATACH 1989–2009**

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Słowa kluczowe: produkcja mleka, gospodarstwa mleczne, mleczarnie, czynniki ekonomiczne.

Abstrakt

Lata 1989–2009 to czas głębokich zmian w polskiej gospodarce i sektorze mlecznym. Po okresie załamania się produkcji i skupu mleka w latach 1990–1995 produkcja i przetwórstwo mleka stopniowo zaczęło się odbudowywać. Zaczęła się poprawiać konkurencyjność cenowa mleka w stosunku do innych produktów rolniczych. Najbardziej korzystnym okresem w tym aspekcie był rok 2005. Na proces zmian w gospodarstwach mlecznych najbardziej wpłynęły mleczarnie, głównie przez sposób ustalania cen za mleko.

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Introductory issues

There are many factors causing changes in the lives of people or economic entities. They include, mainly, a continuous need for “more convenient” solutions. People make improvements in the production technologies of certain goods, make a visible impact on other living organisms (genetic modifications) and are continuously looking for new information from the remotest parts of the world (Internet), etc. Changes also take place in agricultural farms. They are characterised by different paces and intensities. They take place, mainly, in an evolutionary manner under the influence of internal mechanisms and the external environment. As stated by A. Woś, *An agricultural farm changes not only as a result of inherent forces, but also as a result of changes of its closer and further environment. The latter mechanism is becoming increasingly more significant now; it is dynamic [...]. It might be stated that a changing environment interferes in a farm in a deeper and more efficient way than the internal mechanism thereof* (WOŚ 2004, p. 12).

The purpose of the study is to present changes taking place in the milk market and on Polish dairy farms in the period 1989–2009 and to present the main factors outside a farm that affect such changes. The figures used in the analysis have been derived from data provided by the Polish Central Statistical Office (GUS), Institute of Agricultural and Food Economics (IERiGŻ), and the author’s own research.

Changes in the milk production in Poland in the period 1989–2009

Over the last 20 years, the Polish economy has experienced profound changes. They have concerned all sectors of the economy, including the agriculture and food sectors. They have taken place, mainly, under the influence of external factors. Augustyn Woś has identified several periods of changes in the post-war Poland, using the criterion of the introduction of instruments exerting influence on rural areas and agriculture. After 1989, he identified a period of shock therapy (1990–1992), a period of achieving a new balance with a general rapid economic growth (1993–1997), a period of a new crisis (1998–1999), a period of adjustments to the EU structures (1999–2004), and a period of Polish agriculture competing against global agriculture (the period of Poland’s membership in the EU) (WOŚ 2004, p. 18). The aforementioned periods are visibly connected to the situation in the Polish market for milk and the situation of dairy farms. During the first of the said periods (1990–1992) certain new phenomena took place: a growing inflation rate, an

increase in the loan interest rate, abandonment of subsidies to the prices of means of production, abandonment of subsidies to the products manufactured by dairies, cessation of collection guarantees and the collapse of the traditional structure of institutions dealing with the agriculture. In addition, these phenomena were accompanied by a recession which reduced the demand for food products (TOMCZAK 1994, p. 18). The situation of agricultural farms (including those dealing with milk production) became very difficult. State-owned farms usually did not survive such changes, went bankrupt and were privatised. In consequence of the difficult situation, agricultural production in the period analysed decreased. Milk production abruptly decreased. In 1989, milk production in Poland accounted for 15,926 million litres, with 12,770 million litres in 1992 (a reduction by 20%). Even more visible changes took place in milk collection by dairies. In 1989, the amount of milk collected was 11,385 million litres, with only 6,696 million litres in 1992 (a reduction of 40%) (*Statistical yearbook of agriculture* 1998). Some family-run farms resigned from producing milk, but the major change in the production direction took place in state-owned and privatised state-owned farms. Labour-intensive and capital-intensive milk production was mainly replaced by plant production. Milk production in the public sector in the period 1989–1990 decreased by over half (from 2,139 to 982 million litres).

The period 1993–1997, referred to as the period of achieving a new balance with a general rapid economic growth, was characterised by small changes in milk production and milk collection. At the beginning of the period (1993–1995), milk production continued to decrease (by 1,467 million litres). In 1996, milk production and milk collection ceased to decrease (a slight increase took place in comparison to 1995 – table 1).

The period 1998–1999, referred to as the period of a new crisis, left its mark on the dairy sector. Particularly in 1999, global milk production and milk collection decreased in comparison to the period 1996–1998. The worsening economic situation (a decrease in GDP from 6.4% in Q1 to 2.9% in Q4 of 1998) negatively affected the situation of enterprises that were not prepared for an abrupt reduction in demand. The upward trend of the domestic demand for dairy products weakened and the export potential diminished as a result of reduction by the EU member states of imports from Poland and a later collapse of demand from Russia. In consequence of these factors, farm gate prices went down.

The end of 1999 and the following years until May 1st, 2004 was a process of continuous adjustment of Polish dairy farms and dairies to meet the EU requirements. After January 2000, class III milk and unclassified milk was withdrawn from the market. Dairies introduced different prices for extra class milk and other quality classes. In consequence of the foregoing, farms charac-

Table 1

The main data on milk production in Poland in the period 1989–2009

Periods of changes*	Years	Milk production		Milk collection		Cow headage		Milk productivity	
		millions of litres	dynamics 1989=100%	millions of litres	dynamics 1989=100%	thousands of heads	dynamics 1989=100%	litres	dynamics 1989=100%
The first period	1989	15,926	100.0	11,385	100.0	4,987.0	100.0	3,260	100
	1990	15,371	96.5	9,829	86.3	4,919.0	98.6	3,151	96.7
	1991	14,022	88.0	7,722	67.8	4,577.0	91.8	3,082	94.5
	1992	12,770	80.2	6,696	58.8	4,257.0	85.4	3,015	92.5
The second period	1993	12,271	77.1	6,562	57.6	3,983.0	79.9	3,075	94.3
	1994	11,866	74.5	6,149	54.0	3,863.0	77.5	3,121	95.7
	1995	11,303	71.0	6,059	53.2	3,579.0	71.8	3,136	96.2
	1996	11,355	71.3	6,315	55.5	3,461.0	69.4	3,249	99.7
	1997	11,770	73.9	6,770	59.5	3,490.0	70.0	3,370	103.4
The third period	1998	12,178	76.5	7,011	61.6	3,542.0	71.0	3,491	107.1
	1999	11,915	74.8	6,324	55.5	3,418.0	68.5	3,510	107.7
The fourth period	2000	11,878	74.6	6,487	57.0	3,098.0	62.1	3,668	112.5
	2001	11,873	74.6	6,832	60.0	3,005.0	60.3	3,828	117.4
	2002	11,661	73.2	7,007	61.5	2,873.0	57.6	3,902	119.7
	2003	11,881	74.6	7,150	62.8	2,897.0	58.1	3,969	121.7
	2004	11,477	72.1	7,600	66.8	2,796.0	56.1	4,083	125.2
The fifth period	2005	11,566	72.6	8,361	73.4	2,795.0	56.0	4,147	127.2
	2006	11,633	73.0	8,275	72.7	2,824.0	56.6	4,200	128.8
	2007	11,744	73.7	8,222	72.2	2,787.0	55.9	4,292	131.7
	2008	12,000	75.3	8,470	74.4	2,807.0	56.3	4,360	133.7
	2009	11,950	75.0	9,130	80.2	2,730.0	54.7	4,455	136.7

* the periods identified by A. Woś in the study entitled: *W poszukiwaniu modelu rozwoju polskiego rolnictwa*. Wydawnictwo IERiGŻ, Warszawa 2004.

** forecast.

Source: the author's own study based on: *Statistical yearbook of agriculture* 1998, 2001, *Statistical yearbook of agriculture and food economy* 2005, 2008, 2010, *Market analyses – Market for milk* 1999–2010.

terised by a small production scale (having up to 3 cows) ceased to sell milk to dairies (they carried on mainly direct sales). At the same time, large farms, often making great efforts, increased the production scale and adjusted themselves to the sanitary and veterinary requirements. In consequence, the global milk production in 2000 slightly decreased in comparison to 1999, and the milk amount purchased by dairies increased (table 1). The following years observed similar trends as in 2000 – global milk production did not face any significant changes and the milk amount collected by dairies increased.

The period 2005–2009 is referred to as the “period of Polish agriculture competing against global agriculture” (the period of Poland’s membership in the EU). The Polish dairy sector dealt quite well with the competition. At the beginning of the analysed period, farmers benefited from visibly higher milk prices. Later, also milk processing plants, particularly dairies manufacturing

high-quality products intended for export, gained some benefits. The value of milk products exported significantly increased. In the period 2003-2008, the value of milk products exported nearly tripled. The main recipients of the Polish milk products were EU member states.

The changes in the global production and milk collection were accompanied by certain changes in the number of cows and their milk productivity. According to the data presented in table 1, the headage of cows was visibly decreasing until 1996. Later, slight fluctuations with a downward trend took place. The cow milk productivity until 1997 was lower than in 1989. Thereafter, it was increasing until 2009.

The selected macroeconomic factors affecting the changes in dairy farms in the period 1989–2009

The factors affecting the process of changes in dairy farms should be sought in the market conditions prevailing in the analysed period. Mainly the supply and demand of products, services, labour and land and capital (which are differently controlled by state mechanisms) affected the behaviours of farmers, including milk producers. The farmers, under the influence of the market, were forced to make different decisions.

In the opinion of many authors, the economic development of a country affects the development of the agricultural sector. It is economic development which pre-determines the development of agricultural farms (TOMCZAK 2004, p. 13, ZIĘTARA 2009, p. 10). By accepting this thesis, the relations may be analysed between GDP changes in Poland and the milk market and the situation of agricultural farms. According to the data presented in table 2, the gross domestic product per capita (expressed in nominal values) increased between 1990 and 2007 by almost twenty times, and the average salary in the economy (between 1992 and 2007) increased by nearly ten times. The foregoing resulted, on one hand, from a relatively high inflation rate (particularly at the beginning of the period analysed) and, on the other, from the growing labour efficiency. In the period analysed, the milk market also observed an increase in the nominal prices of raw materials. According to GUS, between 1990 and 2007 the nominal prices of milk rose by nearly eighteen times. In the period analysed, the milk collection (described above) slightly increased and the number of farms breeding dairy cows significantly decreased. The relation between the milk collection and the number of farms producing milk is particularly interesting. It is relatively difficult to establish this relation as there is no information about the number of farms breeding dairy cows (particularly at the beginning of the period analysed). The information may be

found in the statistical studies prepared by the Central Statistical Office solely for the years covered by the Census of Agriculture (1996, 2002) and for the years 2005, 2007. Between 1996 and 2007, the number of farms breeding dairy cows decreased by more than half. It is notable that a considerable percentage of farms breeding dairy cows is constituted by farms producing for their own purposes or conducting so-called “direct” sales. The foregoing is evidenced by the data of the Agricultural Market Agency (ARR) presenting the number of the so-called wholesale suppliers (farmers having a wholesale milk quota). The information about the number of suppliers having wholesale milk quotas is available from the implementation of this mechanism on the Polish market (after Poland’s accession to the EU).

Table 2

Macroeconomic conditions versus the situation in the milk market

Periods of changes*	Years	GDP/capita [PLN]	Average monthly salary in the economy [PLN]	Average farm gate price [PLN/100 litres]	Milk collection [millions of litres]	Number of farms breeding cows
The first period	1990	1,549	n.a.**	6.0	9,829	n.a.
	1991	2,152	n.a.	10.0	7,722	n.a.
	1992	2,992	290	18.0	6,696	n.a.
The second period	1993	4,046	390	23.0	6,562	n.a.
	1994	5,454	525	28.0	6,149	n.a.
	1995	7,980	691	44.0	6,059	1,364,000
	1996	10,037	880	51.0	6,315	1,258,000
	1997	12,218	1,066	59.0	6,770	n.a.
The third period	1998	14,316	1,233	61.0	7,011	n.a.
	1999	15,925	1,697	61.0	6,324	n.a.
The fourth period	2000	19,465	1,893	78.0	6,487	n.a.
	2001	20,170	2,045	78.0	6,832	n.a.
	2002	21,010	2,098	72.0	7,007	839,937
	2003	22,050	2,185	72.0	7,150	n.a.
	2004	24,157	2,273	87.0	7,600	n.a.
The fifth period	2005	25,770	2,361	93.0	8,361	730,342
	2006	27,804	2,476	93.0	8,275	n.a.
	2007	30,834	2,673	107.0	8,222	694,876
	2008	33,540	2,944	102.0	8,470	n.a.
	2009	35,210	3,102	102.3	8,870	n.a.

* the periods identified by A. Woś in the study entitled: *W poszukiwaniu modelu rozwoju polskiego rolnictwa*. Wydawnictwo IERiGŻ, Warszawa 2004.

** n.a. – data not available.

Source: the author’s own study based on: *Statistical yearbook of agriculture 1998, 2001, Statistical yearbook of agriculture and food economy 2005, 2008, 2010, Market analyses – Market for milk 1999–2010*, <http://www.lex.com.pl/serwis/mp/2009/0112.htm>

At the end of March 2005 (end of the quota year 2004/2005), the number of farms with a wholesale milk quota accounted for 310,460 (43% of all farms breeding dairy cows). In the quota year 2006/2007 (as of March 31st, 2007), there were 285,000 wholesale suppliers (a reduction in comparison to the first quota year 2004/2005 by 26%). In consequence of the continuing production concentration, there were 24% fewer wholesale suppliers with limits of up to 50 tons of the individual reference amount, and the number of suppliers with a milk quota above 50 tons increased. The greatest increase (by 53%) was observed in the group with the quota of 200–500 tons (SYCH-WINIAREK 2007, p. 27). In the quota year 2008/2009 (as at February 23rd, 2009), the number of wholesale suppliers decreased to approximately 194,000 against approximately 201,000 in April 2008 (SYCH-WINIAREK 2009, p. 21).

The changes in the milk market may, to some extent, be explained by the prices of certain products, production means and production factors in a given period. The relations between prices of certain products are particularly interesting. The relations between the achievable milk prices, prices of cereals, sugar beets and potatoes affect the behaviours of farmers, including farmers running relatively small farms with poor buildings and machines. According to the figures presented in table 3, at the beginning of the period analysed, the price competitiveness of milk in comparison to other products (mainly cereals) was low. This discouraged the farmers from conducting capital-intensive and labour-intensive milk production. They were more likely to be involved in plant production. The second half of the 1990s saw prices fluctuations and a gradual improvement in the relations between milk prices and the prices of other products. In the period 2000–2004, referred to by Woś as the period of “adjustment to the EU structures”, the price competitiveness of milk in comparison to other products remained at a quite stable level, with a slight upward trend. The first full year of Poland’s membership in the EU (2005) was the best time for milk producers in terms of price relations. In 2005, milk prices, in comparison to cereal prices, increased by 37% in comparison to 2004. This was the most favourable price relation in the whole period analysed. 2007, which was a very good year for the dairy sector in Poland and the world, observed interesting phenomena. However, if the relations between milk prices and the prices of other agricultural products (mainly cereals) are taken into account, it turns out that the relations were not as favourable as in 2005. The subsequent years (2008, 2009) saw a reduction in prices for agricultural raw materials, including both milk and cereals. The relationship between milk prices and cereal prices was equal to that in 2004.

Table 3
Relations between milk prices and prices of other products in the period 1990–2009 (average milk price/average price of another product)

Periods of changes*	Years	The selected products					
		wheat	barley	potatoes	sugar beets	cattle for slaughter	porkers
The first period	1990	0.74	0.84	2.71	3.53	0.14	0.08
	1991	1.27	1.47	2.20	4.39	0.17	0.10
	1992	1.10	1.48	1.47	4.51	0.20	0.14
The second period	1993	0.96	1.13	3.11	5.25	0.18	0.14
	1994	1.13	1.32	1.63	5.14	0.16	0.11
	1995	1.24	1.46	1.45	5.45	0.19	0.17
	1996	0.89	1.08	2.27	5.60	0.19	0.17
	1997	1.16	1.41	2.18	6.22	0.23	0.16
The third period	1998	1.30	1.62	2.39	6.31	0.24	0.18
	1999	1.42	1.59	1.95	6.11	0.23	0.20
The fourth period	2000	1.53	1.56	2.24	7.65	0.27	0.21
	2001	1.55	1.62	2.42	7.01	0.27	0.18
	2002	1.65	1.65	2.10	6.42	0.26	0.20
	2003	1.58	1.49	2.12	5.80	0.29	0.23
	2004	1.84	1.78	2.63	4.65	0.26	0.21
The fifth period	2005	2.53	2.49	2.51	5.31	0.23	0.24
	2006	2.08	2.31	2.14	7.22	0.23	0.26
	2007	1.51	1.67	2.63	9.88	0.27	0.31
	2008	1.89	2.27	2.49	9.93	0.25	0.24
	2009	1.73	2.07	2.26	9.31	0.23	0.21

* the periods identified by A. Woś in the study entitled: *W poszukiwaniu modelu rozwoju polskiego rolnictwa*. Wydawnictwo IERiGŻ, Warszawa 2004.

** forecast.

Source: the author's own study based on: *Statistical yearbook of agriculture 1998, 2001, Statistical yearbook of agriculture and food economy 2005, 2008, 2010, Market analyses – Market for milk 1999–2009*.

The impact of dairies on changes in dairy farms in the period 1989–2009

Economic studies carried out by the author and confirmed by other scientific research have shown that dairies have made the greatest impact on the process of changes in dairy farms (MALAK-RAWLIKOWSKA and others 2007, p. 45). Due to dairies which, on one hand, conduct training and consultancy activities for farmers and, on the other, conduct activities enforcing the observance of quality parameters of milk collected, significant progress in milk production has taken place. In the period analysed, dairies experienced profound changes. In the period 1989–1995, the number of enterprises involved in the milk collection and milk processing increased by 1/3, although at the same time the amount of milk processed in dairies decreased by almost

half. As a result of the abandonment of the command-and-quota system and market liberalisation, approximately 100 new companies were established in the dairy sector during the first period. In 1994, 436 enterprises dealing with milk collection and milk processing were operating in the dairy sector, 336 of which were cooperatives (including 309 regional dairy cooperatives and 27 other cooperatives and experimental farms). During subsequent years the number of enterprises operating in the dairy sector gradually decreased, until at the turn of the century it was more or less equal to that observed 10 years before, with the employment rate being more than 10% lower. In the period 2001–2004, the number of enterprises in the dairy sector decreased by almost 1/5, i.e. to 292, including 265 dairies. At the same time, the number of employees decreased by approximately 15% with the milk amount collected and the actual sales value increasing by approximately 18% and 22.8%, respectively. In consequence, the amount of milk processed by a statistical dairy increased by more than 44%, i.e. up to 29.3 million litres, with the number of employees almost unchanged (159 people in 2004 against 156 people in 2000). Over 4 years, the labour efficiency in terms of the amount of milk processed per employee increased by nearly 41%, and the sales value increased by nearly 50%. However, the share of dairies in the sales value of the entire dairy sector remained between 95% and 96% (SEREMAK-BULGE 2005, p. 116).

During the period of operation in the common EU market (2005–2009), the concentration and specialisation of processing continued. In addition to the dairies dealing with milk collection and milk processing, companies specialising in only milk collection or milk processing were also established. In 2008, 293 entities collecting milk were operating, along with 325 entities dealing with milk raw material processing, including secondary processing (*Market Analyses – Market for milk*, 2008).

Due to the nature of the products manufactured, dairies are forced to closely cooperate with farmers. The quality of the raw material supplied pre-determines the quality of the finished products. Many dairies, after the transformation of the economy, took different activities aimed at improving the quality of milk collected. For instance, OSM Piątnica disbursed some funds for low-interest loans for farmers to purchase milk tanks, milking machines and dairy cows. The company implemented the possibility for farmers to buy disinfection preparations for udders, ointments and balsams preventing udder diseases and spare parts for milking machines. In addition, multifaceted training activities were launched (NIEWĘGŁOWSKA 1996, p. 45). In addition to these activities, many dairies began to influence farmers using calculation methods of prices for milk supplied to the dairy. Some components of the aggregate milk price were established. The components of the milk price were changing in the period analysed. At the beginning of the 1990s, an important component was

fat content and the parameters of a given quality class of milk (determined by the specific content of bacteria and somatic cells). At a later time, other price incentives appeared. For instance, in 1994 the Bielmlek cooperative in Bielsk Podlaski introduced subsidies for farmers with their own milk tanks. The subsidy accounted for PLN 0.08 per litre of milk supplied, with the average milk price in December 1994 being PLN 0.39. In that dairy there were only 31 farmers who received such subsidies (PARZONKO 1996, p. 35). The price components evolved at a later time. In the period 2003–2005, the main price components taken into account by most of dairies included: price for a protein unit, price for a fat unit, subsidy for the quality class, subsidy for cooling milk to 4°C, subsidy for having a veterinary certificate, subsidy to the amount of milk produced, subsidy for having cows under control of milk performance, PLN exchange rate. It is notable that in the period analysed, most of the dairies operating in the market had different methods of establishing prices for milk supplied by farmers. The data from three dairies present the situation (table 4).

Table 4

Milk price components taken into account by the dairies analysed, in the years 2003, 2005

Specification	Dairy A		Dairy B		Dairy C	
	2003	2005	2003	2005	2003	2005
For a protein unit [PLN/unit]	0.09	0.12	0.14	0.19	0.12	0.14
For a fat unit [PLN/unit]	0.04	0.06	0.04	0.09	0.03	0.04
For cooling milk to +4°C [PLN/litre]	–	–	0.01	–	0.03	–
For veterinary certificate	0.10	0.12	0.08	–	0.15	0.25
Deductions for lack of a veterinary certificate [PLN/litre]			–	0.10		
For suppliers with cows under control of milk performance [PLN/litre]	0.03	0.02	–	–	0.01	0.01
For long-term contracts [PLN/litre]	–	0.03–0.18	–	–	–	–

Source: the author's own study based on a questionnaire survey.

A very important component of the aggregate price paid to suppliers for milk purchased by dairies included the amount of monthly supplies of milk from a farm. In dairies A and C (dairy cooperatives), the minimum amount of monthly supplies on which price bonuses were given accounted for 1,500 and 2,000 litres, respectively. In dairy B (a limited liability company with a dominating share of foreign capital), the minimum amount of monthly supplies from a farm on which a price bonus was given was 5,000 litres. The maximum bonus

for the amount of milk supplied by a farm was calculated, in dairies A and C (dairy cooperatives), with monthly supplies of at least 10,000 litres of milk from a farm. In dairy B, this threshold accounted for 40,000 litres. In the period analysed, certain changes took place in the method of calculation of price bonuses on the amount of milk supplied by a farm. The most significant changes took place in dairy B (a limited liability company with a dominating share of foreign capital). In 2003, the price bonus on one litre of milk purchased, for producers supplying 5,000 to 10,000 litres of milk, accounted for PLN 0.06 a month, and in the following year, it decreased to PLN 0.01. The producers supplying to dairy B more than 40,000 litres milk a month in 2003 received a price bonus on one litre of milk supplied accounting for PLN 0.19, and in the following years, PLN 0.11. It is notable that in the dairy cooperatives analysed (A and C dairies), the price bonus was reduced for the lowest supplies.

In the following years, the method of calculation of milk prices slightly changed. Most of the dairies, in addition to bonuses for certain parameters, introduced deductions. In dairy A, according to the price list dated April 20th, 2009, for one protein unit farmers received PLN 0.18, and for one fat unit only PLN 0.03. The price list also provided for deductions: for unclassified milk – PL 0.20 per litre, for lack of veterinary certificate (compliance with the sanitary and veterinary conditions) – PLN 0.20 per litre of milk supplied, and for supplies below one thousand litres milk a month – PLN 0.03 per litre. The cooperative maintained bonuses for the amount of milk supplied – the minimum amount on which a bonus was given was 1,500 litres (a bonus of PLN 0.04 per litre) and the maximum bonus was given for supplies exceeding 40,000 litres milk per month (the bonus accounted for PLN 0.13 per litre). In addition, the dairy gave bonuses for having cows in a milk performance program and for maintaining long-term contracts with the dairy.

Summary and conclusions

1. The lives of people and different economic entities (including agricultural farms) are facing on-going changes. In the period analysed (1989–2009), the Polish economy experienced profound changes. They affected all sectors of the economy, including the agricultural and food economy sector.

2. At the beginning of the period analysed (the period 1989–1992), the economic situation of agricultural farms was very difficult. As a result, agricultural produce decreased. Milk production decreased significantly. In 1989, milk production in Poland accounted for 15,926 million litres and in 1992 it accounted for 12,770 million litres (a reduction of 20%). Even more signifi-

cant changes took place in the milk collection by dairies. In 1989, the amount of milk collected was 11,385 million litres and in 1992 it was only 6,696 million litres (a reduction by 40%).

3. The period 1993–1997, referred to as “the period of achieving a new balance with a general rapid economic growth”, was characterised by tiny changes in milk production and milk collection. At the beginning of the period (1993–1995), milk production continued to decrease (by 1,467 million litres). In 1996, milk production and milk collection ceased to decrease.

4. The period 2005–2009 is referred to as the “period of the Polish agriculture competing against global agriculture” (the period of Poland’s membership in the EU). The Polish dairy sector dealt quite well with the competition. At the beginning of the analysed period, farmers benefited from visibly higher milk prices. Later, milk processing plants, particularly including dairies manufacturing high-quality products intended for export, also gained some benefits.

5. The factors affecting the process of changes in dairy farms should be sought in market conditions prevailing in the analysed period. The development of the agricultural sector was affected by the pace of Poland’s economic growth. As GDP per capita and salaries in the national economy increased, the number of dairy farms decreased and the global milk collection by dairies increased.

6. The changes in the market for milk may, to some extent, be explained by the prices of certain products, production means and production factors in a given period. At the beginning of the analysed period (the period 1989–1991), the price competitiveness of milk in comparison to other products (mainly cereals) was low. The second half of the 1990s saw price fluctuations and a gradual improvement in the relations between the prices of milk and other products. In the period 2000–2004, the price competitiveness of milk in comparison to other products remained at a quite stable level with a slight upward trend. The first full year of Poland’s membership in the EU (2005) was the best time for milk producers in terms of price relations.

7. Dairies have had the greatest impact on the process of changes in dairy farms. Due to dairies, which conduct, on one hand, training and consultancy activities for farmers and, on the other, activities enforcing the observance of quality parameters of the milk collected, significant progress in milk production has taken place. Dairies have exerted an influence mainly through milk price calculation methods (which have changed over time) and helped to reinforce desirable behaviour among farmers.

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